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EXTINCT BRITISH QUADRUPEDS.*

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The extinct animals of Great Britain may be divided into two classes:—those which lived in such remote times that the only proof of their former existence here lies in their fossil remains, which have been from time to time discovered; and those which have survived to within such a comparatively recent period that of their former existence here we have historical as well as geological evidence. It is of the latter class only that I now propose to treat, conceiving that for several reasons they will possess a greater interest for most people.

In the first place, it adds much to the attractiveness of the subject if from an examination of ancient records, charters, chronicles, court rolls, and such documents bearing on the subject as have been preserved to us, we are enabled to gather some account of these animals from the lips, as it were, of those who were contemporary with them, who saw and hunted them, and who are able to tell us something of the causes which led to their extermination. In the next place, when we consider that the particular species now referred to, although long since extinct in Great Britain, are still to be found in many parts of the Continent, and have their living representatives in the Gardens of this Society, there seems an additional interest in learning something about them. As we walk round these Gardens, and view such creatures as the Brown Bear, the Wolf, the Wild Boar, the Beaver, and the Reindeer, it is a curious reflection that they were all formerly denizens of this country, and must at one time have been very numerous here. In what localities and under what conditions they existed, by whom they were hunted, and how they gradually became exterminated, are topics which seem well worth investigation.

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* An abstract of one of the "Davis Lectures," delivered at the Zoological Gardens, June 30th, 1881.

With regard to their former haunts, I will ask you to glance at the series of maps before you, on which I have indicated by patches of colour the various localities in which their remains have been exhumed, or which we know from history were frequented by them. These will enable you, in much less time than I could give the details, to form a good notion of the former distribution of these animals in the British islands, premising only that the distribution here indicated affords merely an approximative view of the existing state of things some centuries ago—say at the date of the Norman conquest; for while only those localities are indicated which are known with certainty to have been the former haunts of the animals in question, there are doubtless very many others which were at one time frequented by them, but concerning which at present we have no information.

To realise the conditions under which such animals as the Bear, the Wolf, and the Wild Boar existed in England, it is necessary to consider the aspect of the country when they were denizens of it, and the great physical changes which have since taken place. To go back no further than the date of the Norman Conquest, more than half the country was at that time covered with forest, which stretched uninterruptedly for miles and miles through several counties without a break. Through the greater part of these there were no roads, and we may therefore easily conceive what impenetrable strongholds they afforded to the animals in question. One of these, however, the Bear, was in all probability at this time extinct, for I have been unable to find any historical evidence of its existence here after the Conquest; but the Wolf and the Wild Boar held their ground for many centuries later, as we shall presently see.

Not content with the vast extent of forest which he found existing here on his arrival, William the Conqueror appropriated for the chase large tracts of land, much of which had been already reduced to cultivation, and reconverted it into forest; and his example was followed by Henry II., Richard I., and John, all of whom enforced such stringent and arbitrary forest laws as to cause the greatest possible ill-feeling and discontent throughout the land. Everyone knows how this culminated in open rebellion, and how eventually a remedy was obtained in the shape of the Great Charter, and the Charter of the Liberties and Customs of the Forest. A few years later, when Henry III. confirmed the Charter of the Forest, he directed that all the ground which had been added to the ancient forests by his predecessors should be disafforested and restored to rightful owners.

From that time to the present the forests have become gradually reduced in extent, until, instead of extending for sixty or seventy miles at a stretch, they dwindled down to mere remnants of perhaps not more than six or seven miles diameter.

In Henry VIII.'s time a good many ancient forests were destroyed, particularly in the north of England. James I. sold and gave away a great many of the royal forests, which were gradually reduced in area, and some of them entirely cleared. Towards the end of the sixteenth and beginning of the seventeenth centuries large tracts of forest, pine, birch, and oak, in Scotland, were purposely set on fire and burnt down, in order to destroy the wolves with which they were infested.

Thus we see how the old forests gradually became split up into mere remnants of their former greatness, which remnants at the commencement of the present century were found to be sixty-nine in number, with thirteen chases and upwards of 750 parks.* It is easy to understand how this breaking up of the forest land into patches led to the destruction of the wild beasts in its recesses; for so long as they could keep ahead of their pursuers through interminable tracts of forest, they were in no immediate danger of becoming extinct; but so soon as large tracts of cleared and cultivated ground intervened between their strongholds, they were more easily surrounded and destroyed. When, in addition to these facilities for hunting, Acts of Parliament were passed which provided that rewards should be paid for their destruction, their doom in a few years was sealed.

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* In Domesday thirty-one parks only are mentioned.

This of course applies only to the forest animals, as the Wolf and the Wild Boar, the Roe, the Wild Cat, and the Marten, of which all except the last-named are now extinct in England. The Bear, as already remarked, had become extinct at a much earlier period, namely, before the Conquest, while the Beaver and the Reindeer, as we shall presently see, were to be found in very different haunts.

That Bears were at one time common in Britain is clearly testified by the abundant remains which have been discovered from time to time in various parts of the country, not only in England and Scotland, but also in Ireland.

With regard to Ireland, however, it should be observed that in the opinion of palæontologists it is doubtful whether any of the Ursine remains there discovered are referable to *Ursus arctos*, the common Brown Bear, a comparison of the osteological and dental characters indicating that they belong to a much older and prehistoric form, *Ursus fossilis*, the progenitor apparently of the existing *Ursus ferox*.

The relationship, however, between *Ursus ferox*, the Grizzly Bear now repelled to Western North America, and *Ursus arctos*, the Brown Bear, is so close, not only as regards fossil, but also recent individuals, that externally they are indistinguishable.

From an old Welsh MS. relating to ancient British laws and customs, discovered by a friend of the illustrious John Ray, it appears that the Bear was formerly reckoned amongst the beasts of chase in this country, and its flesh was esteemed equally with that of the Hare and the Wild Boar. Many names of places in Wales still indicate its former existence there. That it was killed and eaten by the Romans during their occupation of Britain we know, from the discovery of its remains in some of their refuse heaps, as at Colchester, and Richmond in Yorkshire. And not only did they chase and kill bears here for sport as well as for food, but they exported them to Rome, as we learn from Martial and Plutarch, for the purpose of tormenting malefactors and for exhibition in the Roman arena. These are referred to as Caledonian bears, and Scotland appears to have been the great stronghold for them, at least during the later years of their existence in Britain. Bishop Leslie (1578) states that the Caledonian forest was once full of them, and Camden, our great antiquary, writing of Perthshire, particularly refers to this immense wood, "dreadful for its dark intricate windings, and for its dens of bears." That these animals existed in Britain during the eighth century is to be inferred from a reference made to them in the "Penitentiale" of Archbishop Egbert, which was drawn up about A.D. 750, and even in the time of Edward the Confessor, nearly three centuries later, it would seem that they were still to be found here (although doubtless in greatly diminished numbers), for we learn from Domesday that the town of Norwich furnished annually one Bear to the king, and six dogs for the baiting of it.

I have been unable to find any evidence of Bears in any part of the British Islands at a later date than this, although it has been frequently stated, on the authority of Pennant, and is generally believed, that the last British Bear was killed in Scotland in 1057 by a member of the Gordon family, who, in reward for his valour, was directed by the king to carry three bears' heads on his banner.

This, however, is altogether a fallacy. Pennant quoted from a translation* of a Latin manuscript history of the Gordon family, a copy of which is preserved in the Advocates' Library at Edinburgh, and reference to the original Latin shows that the animal slain by the Gordon in question was not a Bear, but a Boar (*immanem aprum*). There being a difference of only one letter in the name, it is easy to understand how the mistake arose.

It is not so easy to realise the fact that the Beaver was once a native of the British Islands, so utterly unsuited to its habits does the country appear at the present day. That it once existed here, however, is indisputable, for, in the first place, we may see in various museums the skulls and other portions of the skeletons of Beavers which have been exhumed in different parts of England and Scotland; and in the next place, we have fortunately preserved to us the testimony of those who lived contemporaneously with them, and who had opportunities of observing them in their natural haunts.

A glance at the map (above referred to) will show where remains of the Beaver have been found, and it will be observed that the localities are pretty widely scattered.

Just as the Beaver is still trapped in the New World for the sake of its fur, so, for the same reason, used it to be hunted in

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* Published in Edinburgh in two vols, 1726.

Britain in the tenth century. We learn from the code of Welsh laws made by Howel Dha, A.D. 940, that at that date the Beaver was one of the animals of whose fur the king's garments were made, the fur of the Marten and Ermine being also employed, and that the value of a Beaver's skin was fixed at 120 pence, that of a Marten being only 24 pence. This shows that even at that period the Beaver was considered rare. But although scarce, it had not become extinct in Wales even 250 years later. For in 1188, when Giraldus Cambrensis travelled through Wales, in company with Baldwin, Archbishop of Canterbury, he found Beavers in the River Teivi, in Cardiganshire, and in the 'Itinerary' which he wrote, and which has fortunately been preserved to us, he has left a curious account of their habits, derived partly from report and partly from his own observation. His description of the animals and of their mode of building their "castles,' as he terms them, with great boughs which they cut with their teeth, leaves no room for doubt that it was the Beaver and not the Otter to which he referred.

The Welsh had two names for it, *Avanc* or *Afangc*, signifying "river-dog" and *Llostlydan* or "broad-tail," and there are several places not only in Cardiganshire, but also in Montgomeryshire and Caernarvonshire, which are named after the Beaver, the Welsh names signifying "the Beaver's Pool," "the Beaver's Dam," and "the Vale of the Beavers."

The Highlanders, too, had a peculiar name for the Beaver, namely, *Losleathan*, or *Dobhran losleathan*, the Broad-tailed Otter; and the tradition current in some parts of Scotland, that it formerly existed in that country, is confirmed by the discovery of its remains in various Scottish localities. Giraldus, indeed, in 1188, had heard of the alleged existence of Beavers in one river in Scotland, but was informed that they were then very scarce there.

Some confirmatory evidence of their presence in Scotland about that period is afforded by the fact that in the enumeration of furs upon which duty had to be paid on exportation at Scotch ports, in the reign of David I. (1124—1153), besides Fox, Stoat, or Ermine, Marten, and Wild Cat, mention is specially made in all the MSS. of the skins of Beaver and Sable, the latter being probably the Polecat. And among the export duties licensed to be levied at Newcastle-on-Tyne in the time of Henry I.

(1100—1137), we find the *tymbra beveriorum* fixed at fourpence.

When the Beaver became finally extinct in the British Islands is uncertain, and perhaps impossible to discover; but Boethius, writing in 1526, enumerates *fibri* or Beavers amongst the *feræ naturæ* of Loch Ness, whose fur was in request for exportation towards the end of the fifteenth century.

From that time until the present there is a blank in the history of British Beavers, and although it is not at all probable that we shall ever see Beavers again in a wild state in this country, it is interesting to note the success which has attended the experiment made by the Marquis of Bute, who within the last few years has turned out some imported Beavers in the Isle of Bute, where they have not only thriven and done well, but have increased and multiplied.

In connection with the subject of their increase in this country, it may be noted that in the gardens of this Society the Beavers have bred several times, and between the years 1871 and 1874 several young ones were reared.

Another animal to be seen in the Gardens of this Society—the Reindeer—is of special interest as having been once a native of the British Islands. There is abundant proof of its former existence here in the quantity of horns, skulls, or other portions of the skeleton which have been brought to light at various times in different parts of the country.

This animal must have been one of the earliest arrivals on British soil after the ice and snow of the glacial epoch began to disappear, and it is in caverns and river gravels and sands of past glacial ages that we first meet with its remains. Its abundance in British deposits of this date is very remarkable. Professor Boyd Dawkins has found portions of its bones and horns in no less than thirteen out of twenty-one caverns examined by him, while the Red-deer was found only in seven; thus, contrary to what is generally assumed to be the case, the Reindeer predominated in numbers over the Red-deer at the time the British bone caves were being filled.

In the post-glacial river deposits the same preponderance of the Reindeer is observed. It has been found in the gravels of Brentford, in a railway cutting at Kew Bridge, and higher up the Thames in a gravel bed at Windsor, where, in the spring of 1867, numerous remains were discovered, evidently swept down by the current from some point higher up the river.

It will be seen from the accompanying map how generally distributed this animal was at one time, not only in England, but also in Scotland and Ireland.

During the arctic severity of the past glacial climate the remains of the Red-deer were rare, while those of the Reindeer were most abundant. During the prehistoric period the Red-deer gradually increased in number, while the Reindeer as gradually became extinct. In its rarity in the latter epoch we have proof of the great climatal change that had taken place in France and Britain.

The last haunt of the Reindeer in the British Islands, so far as can now be ascertained, appears to have been the lonely lichen-covered hills of Caithness, where, as we learn from an Icelandic Saga, it used to be hunted in the twelfth century by the jarls of Orkney, who were in the habit of crossing over the Pentland Firth for the purpose every summer.*

Although this assertion rests only on the authority of the author of the 'Saga' referred to, there is nothing improbable in it. He must have been well acquainted with the animal himself. The hills of Caithness lie in the same parallel of latitude as the South of Norway and Sweden, where the animal was living at the time, and its food, the brushwood, and especially the Reindeer-moss (*Cladonia rangiferina*), is still found extensively over Scotland.

There is another point worth notice, as remarked by Professor Boyd Dawkins. The Reindeer is mentioned in the 'Orkneyinga Saga' along with the Red-deer. At the present day these animals occupy different zoological provinces; so that the fact of their association in Caithness would show that in the twelfth century the Red-deer had already appropriated the pastures of the Reindeer, which could not retreat further on account of the sea, and was fast verging on extinction. From Linnæus's time down to the present day, even in Sweden and Norway, it has been retreating farther and farther north.

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* The 'Orkneyinga Saga' quoted by Torfæus in his 'History of Orkney,' and edited by Jonæus in 4to, 1780. The jarls of Orkney referred to (Rognvald and Harald), according to Jonæus, hunted in Caithness in 1159.

I fear that time will not permit me to say much of the experiments which have been made from time to time to re-introduce the Reindeer in this country. They have been frequently imported and turned out in what appeared to be situations suited to their habits, where suitable food also was to be obtained, but from some cause or other they have never lived very long.

In the Gardens of this Society they have thriven very well. In March, 1878, two female Reindeers were received in exchange, and in May of the same year two young ones were born. At the present time there is one to be seen in one of the paddocks on the bank of the canal beyond the Elephant house.

In the Wild Boar we have an animal which for several centuries later held its ground in England in spite of the adverse circumstances by which it was surrounded, and which eventually brought about its extinction. This was owing partly to its being a forest animal (and there was still forest enough in many parts of the country to afford it concealment), and partly to the fact that, being a beast of chase, it was for a long time protected to a great extent by those who delighted in Boar-hunting: that is to say, that while they hunted and killed individual boars from time time for their own amusement, they allowed no one else to do so except in their company, and the laws relating to trespass in pursuit of game were very stringent.

As might be expected, we find records of the chase of the Wild Boar in England at a very early period; and even before the date of such records figures of the animal appeared on ancient British coins and Celtic works of art, showing that it was one of the oldest forest animals in Britain. The Romans, who hunted it here, whenever an extraordinary large and savage Boar was killed, were in the habit of erecting memorial stone altars, which they dedicated to the god Sylvanus out of gratitude for the death of the monster. This we know from the discovery of several such altars, or the remains of them, bearing inscriptions (in some cases nearly perfect) which explain their history.

Time will not permit me to enlarge upon the curious representations of Wild Boar-hunting which appear upon Saxon MSS., Roman tablets, and Norman sculptures, and which are as interesting to the naturalist as they are to the archæologist. It must suffice if I refer briefly to a few of the more curious episodes in the history of the British Wild Boar from the time when the Welsh King, Howel Dha, in the tenth century, framed his code of forest laws, and provided that the Wild Boar should be hunted in the month of November, until the time when it became actually extinct about the middle of the seventeenth century.

There is a story told of Edward the Confessor's time, apparently well authenticated, to the effect that in the Forest of Bernwood, in Buckinghamshire, a large Boar, which had killed many an assailant and done much damage, was at length slain by a huntsman named Nigell, who was rewarded by the King with a present of land, upon which he built a house, which he named Boarstall, and this property has descended through the Nigells to the Aubreys, in whose possession it remains at the present day.*

William the Conqueror, who spent the greater part of his time in hunting, especially in the great forests of Sussex, Hants, and Wilts, was so addicted to Boar-hunting that he punished with loss of eyes any unauthorised person who should slay a Boar.

Heury I. also was very fond of Boar-hunting, and both he and his immediate successors were in the habit of making grants of land in different parts of the country to sportsmen in consideration of their undertaking to keep a certain number of Boar-hounds and Wolf-hounds for the King, or to supply him with horses and Boar-spears whenever he came to hunt in their neighbourhood.

Edward the Third used to hunt the Wild Boar in Oxfordshire, near Blechesdon, and whenever he went to stay at Cornbury Park, in that neighbourhood, was always provided with Boar-spears and well-trained hounds.

The form of the spear seems to have varied at different periods. It was originally a stout broad blade, but was afterwards made with two or thee sharp forks or prongs, which were thought to be more effectual in preventing the Boar from breaking through upon the huntsman. The mode of hunting generally adopted was to track the Boar to its lair, to rouse him, and hunt him till the hounds brought him to bay, and then to ride in and spear him, or dismount and despatch him, single-handed, with a sword. The latter feat, when successfully accomplished, of course brought the greatest credit to the huntsman.

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* 'Archæologia,' vol. iii., pp. 3, 15; and Blount's 'Ancient Tenures,' p. 242 (ed. 1815).

There is a curious story recorded in connection with a Boar-hunt which took place in Yorkshire in the time of Henry II. It appears that three gentlemen, whose names are given, William de Bruce, Ralph de Percy, and a freeholder in the neighbourhood of Whitby, named Allotson, met on the 16th October, 1159, to hunt the Wild Boar in a certain wood called Eskdale-side, belonging to the Abbot of Whitby. After a bit their hounds found an old Boar, which they hunted for some time, and ran him very hard towards a chapel and hermitage tenanted by a solitary monk of Whitby, who was a hermit. The Boar, being hard pressed, took in at the chapel door, laid him down, and there died. The hermit, being a humane man, shut the door to keep out the hounds, and went on with his meditations. Presently the huntsmen arrived, and, finding the hounds checked, made a cast right and left to recover the scent, never dreaming that the Boar was in the chapel; but the hounds, persistently refusing to leave the door, they broke it in, and, to their astonishment, there lay the Boar dead. The story goes that, being very angry at their hounds being checked, they went at the hermit with their Boar-spears, and wounded him so seriously that a few weeks afterwards he died. In the meantime the affair came to the ears of the Abbot of Whitby, who, being in great favour with the king, refused to allow them to take sanctuary at Scarborough, whither they had fled on hearing how the matter was likely to end. Having lost their privilege of sanctuary, they were liable to the extreme penalty of the law. Fortunately, however, the hermit interceded with the Abbot in their behalf, and a pardon was obtained on condition of their performing a certain penance, which was then and there enjoined them.

Boar-hunting was at one time such a matter of every-day occurrence, that those who participated in it, or witnessed it, seldom took the trouble to preserve any record of their sport, except when, in a case like that just mentioned, some unusual circumstance occurred to make the day memorable. But in the old Household Books, which were kept by the stewards of noblemen and gentlemen of position, we frequently find entries of payments made in connection with the sport, often in the shape of rewards paid to keepers and beaters when the king came to hunt in their neighbourhood. Thus, when Henry VIII. visited Edward Seymour, afterwards Earl of Hertford, at Savernake, in Wilts, Wild Boars were killed in Savernake Forest, and the Household Books of that period (1539—1543) show the sums that were paid in connection with the sport.

When James I., in 1617, visited Sir Richard Hoghton at Whalley, in Lancashire, he was regaled with, amongst other things, "Wild Boar pye." In the same year the king hunted the Boar in Windsor Forest, as we learn from a letter addressed to Sir Thomas Puckering by a gentleman who had just brought all the news from the Court, then held at Hampton.

The exact date when the Wild Boar became extinct in Great Britain is not easy to discover. Wild swine are casually referred to in an old account book kept by the steward of Earl Ferrers as existing at Chartley, in Staffordshire, in 1683, and this is the latest date at which I have been able to find any mention of the animal. It is quite possible that it may have lingered on in the northern parts of our island until the close of the seventeenth century. There are many local traditions which fix its extermination about this date. For example, in Westmoreland it is asserted that the last Wild Boar was killed about 200 years ago near Staveley, in that county, by a man named Gilpin, the spot being still marked by an inn known as the "Wild Boar Inn," and the bridge over the beck called Gilpin's Bridge.

It is also very probable that just as the Wolf survived in Scotland and Ireland to a very much later period than it did in England, the Wild Boar may also have lingered on in some of the great forests with which parts of Scotland and Ireland were clothed during the last century; and we know from various fragments of evidence, both geological and historical, that in both these countries Wild Boars were once very numerous. Many localities still indicate, by the names they bear, particular parts of the country where the animal was formerly common; and this is not only the case in England, but also in Scotland and Ireland.

Several attempts have been made at various times to re-introduce the Wild Boar in this country, notably in the New Forest, Wolmer Forest, at Charborough Park, Dorsetshire; in Essex, in the woods between Mersey Island and Colchester; at Chartly

Park, Staffordshire, and in Derbyshire; but none of these attempts resulted in the re-establishment of the species in England, much to the satisfaction probably of all but the few enthusiastic sportsmen who were bold enough to make the experiments referred to.

We come now to the Wolf, which was the last to disappear of those animals which are now extinct in the British Islands, and on this account partly the materials for its history as a British animal are more complete than is the case with any of the others.

The researches of geologists have brought to light its fossil remains in various parts of the country, and it is evident that at one time there was perhaps scarcely a county in England and Wales in which Wolves did not abound, while in Scotland and Ireland they must have been even still more numerous.

The vast tracts of unreclaimed forest land which formerly existed in these realms, the magnificent remnants of which in many parts still strike the beholder with awe and admiration, afforded for centuries an impenetrable retreat for these animals, from which it was well-nigh impossible to drive them. It was not indeed until all legitimate modes of hunting and trapping had proved in vain, until large prices set upon the heads of old and young had alike failed to compass their entire destruction, that by cutting down and burning whole tracts of the forests which harboured them, they were at length effectually extirpated.

It is currently believed that in England the Wolf was completely exterminated by King Edgar, who, by relinquishing the fine of gold and silver imposed upon the Welsh princes by his uncle Athelstane after the battle of Brunanburgh, in 938, and exacting in its stead the annual production of 300 Wolf skins, is said to have killed them all off in four years. But this, if true,* must be taken to apply only to Wales, not only because the Welsh chieftains had no authority to hunt out of their own dominions, but because there is abundant documentary evidence to prove that Wolves existed in England for at least five hundred years later, while in Scotland and Ireland, as we shall presently see, they survived even to a still later date.

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* Owen, in his 'Cambrian Biography,' states that it was not until *forty-five* years after the edict of Edgar that the last Welsh Wolf was slain.

Wolves are expressly mentioned in the Forest Laws of King Canute, and Liulphus, a dean of Whalley in the time of Canute, was celebrated as a Wolf-hunter at Rosendale, in Lancashire.*

Upon many an English battle-field, at the period of the Norman Conquest, as we learn from incidental remarks in the old chronicles, the bodies of the slain were preyed upon by Wolves.

Henry II. and John both hunted the Wolf in various parts of England, and kept regular establishments for the purpose, paying large prices for good Wolf-hounds, and liberal wages to "the keepers of the King's Wolf-hounds," as they were called.

In Henry III.'s reign Wolves were sufficiently numerous in some parts of the country to induce the king to make grants of land to various individuals upon the express condition of their taking measures to destroy these animals whenever they could be found; and Edward I. formally appointed Sir Peter Corbet to be Wolf-hunter-in-chief, commissioning him to destroy all the Wolves he could find in the counties of Gloucester, Worcester, Hereford, Salop, and Stafford. When he died, in 1301, his hounds were all brought to the king, and there is an entry to be found in the Wardrobe Accounts of this reign (preserved amongst the additional MSS. in the British Museum), showing the payment of a reward to the huntsman who brought them.

Towards the close of that century, in Richard the Second's reign, Wolves must have been still pretty common in some parts of the country, as, for example, in Yorkshire; for in the Account Rolls of Whitby Abbey at that period we find entries of payments made for curing and dressing Wolf-skins; and in the Accounts of Bolton Priory are entries of rewards paid for killing Wolves in the Craven district.

During the reign of Henry VI. it appears that grants of land were still made on condition of destroying the Wolves in certain localities where they still lingered, as in the Forest of Sherwood, but they were then getting very scarce, and the last in England was probably killed in Henry the Seventh's reign, when a member of the Barnes family earned a reputation as a noted Wolf-hunter in Durham.

The old books on hunting state that the season for Wolf-hunting was between the 25th December and the 25th March.

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* Whitaker's 'History of Whalley,' p. 222.

This, of course, was only so long as Wolf-hunting was an amusement and a royal sport. As soon as it became a necessity, and a price was set on the animal's head, it was killed whenever and wherever it could be found.

The price paid for Wolves' heads in Ireland during Cromwell's protectorate was something considerable. By an Order in Council, dated at Kilkenny, April, 1652, the exportation of Wolf-dogs was prohibited, and the following year another Order in Council directed that whoever should capture or kill a Wolf and produce the head should receive, from the Commissioners of Inland Revenue, £6 for a bitch-wolf, £5 for a dog-wolf, £2 for a full-grown cub, and 10*s*. for a young one.

It would naturally be supposed that the offer of so high a reward would speedily bring about the extermination of the last Wolf in Ireland, but it was not so; great numbers were killed, but numbers still survived, so much so, that even ten years later, as appears by the Journal of the House of Commons, Sir John Ponsonby reported, from the Committee of Grievances, that a Bill should be brought in to encourage the killing of Wolves and Foxes in Ireland.

In 1700 there where still Wolves in the great woods of Shillela between Carlow and Wicklow, and in 1710 rewards were paid for the destruction of some in Kerry. Richardson, the author of a work on "The Dog, its Origin, Natural History, and Varieties,' knew an old gentlemen, in 1841, whose mother remembered Wolves to have been killed in Wexford between the years 1730—40; and Sir J. Emerson Tennant was informed by the Very Rev. Holt Waring, Dean of Dromore, who was born in 1766, that he perfectly well recollected, when he was a boy, a foal belonging to his uncle being killed at Waringstown, Co. Down.

This places the extinction of the Wolf in Ireland at a much later date than is currently accepted; and the same may be said of Scotland, for, although one of the last Wolves in Scotland was killed more than twenty years before it became extinct in Ireland, this was more than sixty years after the date fixed by Pennant for its extirpation in Scotland. His statement that the last of its race was slain in 1680 by Sir Ewen Cameron, of Lochiel, must be taken to refer only to that particular district in which Sir Ewen Cameron lived, and not to the whole of Scotland, for several were killed in other districts at subsequent dates up to 1743, when the last in Inverness and (as there seems every reason to believe) the last in Scotland was killed at a place between Fi-giuthas and Pall-a-chrocain, amongst the wilds of the Monaidh-laith mountains.

Thus, in spite of the many Acts of Parliament which were passed to effect the destruction of Wolves in Scotland;* in spite of the numerous grants of land that were made on the express condition of killing Wolves; in spite of the large tracts of forest which were cut down or burnt at the end of the sixteenth and beginning of the seventeeth centuries, on purpose to get rid of these animals; and in spite, moreover, of the rewards which were constantly being paid for their destruction, it was not until 150 years ago, practically, that the object was finally accomplished.

Now, to what conclusion does this lead us? In the earliest times of which history takes cognisance, when this country was for the greater part either dense forest, or fen, or bleak moorland waste, when agriculture was in its infancy, when the lower classes were in the condition of serfs, and those who had wealth spent it in feasting and hunting, the country was overrun with the wild animals of which I have been treating, and which served no other purpose than to furnish amusement and, in some cases, food to those who hunted them.

Gradually, as the forests were cleared and the waste lands cultivated, as the condition of the lower orders was improved, and as they rose from mere tenants-at-will to landowners with vested interests in the soil they cultivated, opposition was made to the summary way in which their land was afforested, and noxious animals preserved which destroyed their flocks and their crops, until at length this state of things was remedied by royal charter. The forest laws were repealed, or considerably mitigated, and the complainants secured against spoilation. All woods that had been taken in, or, as it was termed, *afforested*, to the prejudice of the owners, were *disafforested*, and the owners were no longer compelled to tolerate the presence in their neighbourhood of ferocious animals, and which were then slain wherever and whenever they could be found. It is true they survived in reduced numbers for some centuries later, in consequence of the utter impossibility of dislodging them from the almost impenetrable forests and mountain fastnesses to which they were driven. But the gradual removal of these obstacles, and the insular nature of the country from which they could not escape, finally, and of necessity, brought about their extinction.

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* Acts with this object were passed in 1427, 1457, 1525, and 1577.

The facts thus briefly narrated teach us also something more than this. They show us what a length of time it has taken to eradicate a single species, even in so comparatively limited an area as that of the British Islands, and under circumstances which seemed so favourable to the object in view.

They remind us that now, in our own day, there are species passing away which will sooner or later have to be classed with those I have enumerated. The Roe-deer is already extinct in England, although still common in some parts of Scotland. The Wild Cat has not only been exterminated in England, but is no longer to be found in the south of Scotland, that is to say, not south of a line extending from Oban on the west coast, along the southern and eastern borders of Perthshire, and thence in a north-westerly direction to Inverness.

The Marten, although still to be found in parts of Cumberland and Westmoreland, and in certain districts in Scotland and Ireland, has become so rare as a British animal as to make its occurrence when noted a matter of comment. The Polecat will soon be as rare. All these animals are gradually passing away, and it behoves naturalists, while they have yet the opportunity of so doing, to investigate, each in his own neighbourhood, the life-history and distribution of these particular species, so as to place on record the most interesting facts concerning them, facts which hereafter it may be impossible to obtain. It is scarcely to be expected that any of us will live to hear of the complete extinction of any of the species just named; but when we consider how comparatively little our forefathers did to elucidate the Natural History of the country in which they lived, and how fragmentary still is our knowledge of the wild animals by which they were surrounded, it is to be hoped that we may be able to do more for posterity in this respect than our ancestors have done for us.

In Zoology as in History the value of contemporary records is inestimable.

ON THE HABITS OF THE KEA OR MOUNTAIN PARROT OF NEW ZEALAND.*

By T. H. Potts, FL.S.

If a stranger accompanied a party of back-country flockmasters or shepherds on a visit of inspection to one of our museums, on looking over the birds of New Zealand, he might feel at a loss to account for the strong interest displayed by the mountaineers in the Kea—a parrot that at a transient glance pretty closely resembles the noisy Kaka (*Nestor meridionalis*), yet one might venture to predict that it would be the first bird inquired for and pointed out, and its destructive habits dwelt upon with startling emphasis.

In the spring-time of 1871, and subsequently, the writer published some brief accounts of the Kea, showing the progress of development in its then newly acquired carnivorous habit.† It is now proposed to give a life-history of the species, and the truest way of doing so will be to refer to one's early acquaintance with it during its age of innocence, before it had acquired that strange Epicurean taste for dainties that has led to the commission of deeds of savage cruelty. We shall thus see the bird harmless enough in the dull epoch of Maori conservancy, later on, unable to restrain its mischievous propensities, when tempted by peaceful flocks of defenceless animals introduced by the "pakeha" into the wild rugged country of its own peculiar range. A wish to render this account as complete as possible must be held as excusing the writer for entering into minute details that to some may appear tedious, but it must be remembered that the subject is one that is no longer of interest only to naturalists; it has grown to be of importance to numbers of mountain sheep-farmers. The time cannot be far distant when agricultural and pastoral associations will have to take cognisance of the mischievous influence of this savage bird on an important industry that promotes the useful occupation of a considerable tract of country.

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* *Nestor notabilis*, Gould; the Green or Mountain Parrot; Kea of the Maoris; and Kaieo or Sheep-killer of the shepherds of the Southern Alps.

† See papers read before the Wellington Philosophical Society and the Philosophical Institute of Canterbury, in 'Transactions of the New Zealand Institute,' vol. iii.; 'Journal für Ornithologie,' März, 1872; Dr. O. Finsch, 'Revision der Vögel Neusielands'; Brehm's 'Thierleben—Vögel,' vol. i., p. 166; 'Nature,' vol. iv., p. 489; 'The Kea—Progress of Development'—'Nature,' vol. v., p. 262; 'Change of Habits in Animals and Plants'; and 'The Zoologist,' 1871, p. 2855; 1880, p. 57.

Through the kind offices of Mr. Robert Wilkin, the writer has been greatly assisted with valuable information acquired from notes contributed by sheep-farmers, owners of stations, and shepherds on many runs in the southern alpine country. Amongst these Messrs. Thomson, A. M. Clarke, McCallum, Crisp, F. Andrew, and McColl have supplied communications of great interest; their experience on the subject extends over many years; they possess an intimate knowledge of a wide stretch of mountainous land, including the grand and picturesque scenery of the lake district, Te Anau, Wakatipu, Mararoa, Mount Pisa, Motatapu, Overshot, Motukuku, Matukituki, Mount Aspiring, to Ben Ohou, &c. The Kea (or Kaieo) is the name as spelt by some shepherds and flockmasters, and which word perhaps should be used, as it has been adopted by many of those who from the nature of their employment are most likely to take the greater amount of interest in the bird and its mode of life.

The Kea was first made known to science as early as 1856 by the Hon. W. B. Mantell, from specimens which were obtained from the southern alpine country, and the late Mr. Gould described the species under the name of *Nestor notabilis.* A few years later, another good example, astray from the higher ranges, was procured at a sheep station on the Orari, in South Canterbury; the fame of this *rara avis* spread through the province; soon afterwards skins were got from the back-country sheep-runs, and in a short time museums were enabled to enumerate "the green parrot" as one of the choice and rarer articles in their traffic of exchanges.

In order to convey a correct impression of the Kea and its habits, it is necessary to give a brief outline of the features of the country in which it is to be found. We have most frequently observed it above the gorge of the Rangitata, one of the great snow-rivers, as they are termed. This stream, which derives its source from the glaciers which are embedded in the gloomy and secluded fastnesses of the Southern Alps, is periodically swollen by the melting of the snow, and by the heavy rain from the north-west which falls during the spring and autumn months; fed by numerous creeks and tributaries from every converging gully, its volume increases, it rushes noisily and impetuously over its rough boulder bed, till the junction of the Havelock, the Lawrence, and the Clyde swells its waters into a large river. The leafy, rugged mountains which imprison it present almost every conceivable variety of outline; jagged peaks crowned with snow; countless moraines point out where the avalanche and snow-slip have thundered down into the valley below. The river is bordered here and there by grassy flats, hanging woods of timber trees, in which the brown-tinted *Totara*, the silvery *Phyllocladus* with its purplish points, the small-leaved *Kohai*, and the soft bright foliaged ribbon-wood contrast well with the dusky hue of the dark-leaved *Fagus;* far above, dwarf vegetation in all the wonderful variety of alpine shrubs and flowers, struggles up the steepest slopes, adorning the frowning precipice and foaming cascade, lending its aid in forming scenes of picturesque and romantic grandeur, in which rich and varying tints of perennial verdure gratify the eyes of the spectator with their beauty. This is the home of the Kea—amongst holes and fissures in almost inaccessible rocks, in a region often shrouded with dense mists or driving sleet, where the north-west wind rages at times with terrific violence; here the Green Parrot may be observed, entering or leaving crevices in the rocks, or soaring with motionless wings from peak to peak, far above the screaming Kaka or the chattering Parroquet; the swift-winged Falcon is perhaps the sole intruder in its wild domain. At early dawn its peculiar note is heard, very like the mewing of a cat, though in some of the more secluded gullies it may be noticed throughout the day; it really appears to wake up into activity at dusk, being, to a certain extent, nocturnal in its habits. It is scarcely less gregarious than its congener *N. meridionalis;* in the moonlight nights of winter, numbers have been observed on the ground feeding; it can hardly be deemed an arboreal bird in the strict sense of the term.

The rigour of a hard winter, when the whole face of the alpine country is changed so as to be scarcely recognisable under a deep canopy of snow, is not without its influence on the habits of this hardy bird; it is driven from its stronghold in the rocky gully, and compelled to seek its food at a far less elevation, as its food supply has passed away gradually at the approach of winter, or lies buried beneath its reach. The honey-bearing flowers have faded and fallen long before; the season that succeeded with its lavish yield of berries and drupes that gaily decked the close-growing *Coprosma*, the trailing *Pimelia*, or the sharp-leaved *Leucopogon*, has succumbed to the stern rule of winter. Nor has this change of seasons affected the flora of the Alps alone. The insect world, in a thousand forms, which enlivened every mountain gully with the chirp and busy hum of life, now lies entranced in its mummy state, as inanimate as the torpid lizard that takes its winter's sleep sheltered beneath some well-pressed stone. Under the effects of this great change that cuts off such a supply of food, the Kea gradually descends the gullies, where a certain amount of shelter has encouraged the growth of the *Kowai* that yields its supply of hard bitter seeds, the beautiful *Pittosporum* with their small dark seeds packed in gluten, and the black-berried *Aristotelia;* these and numerous other shrubs or trees, such as the Pitch-pine and *Totara*, furnish some of the means of life to this parrot. It is during the continuance of this season that we have had the best opportunities of becoming somewhat familiar with it.

Within the last few years it has discovered the out-stations of some of the back-country settlers. Of course every station has that indispensable requisite, a meat-gallows; it has found out and fully appreciates the value of this institution, as occasionally affording an excellent supply of food; the gallows is generally visited by night, beef or mutton equally suffer from the voracity of the Kea, nor are the drying sheep-skins despised. These visits may be looked upon quite as social gatherings, for it is by no means a rare occurrence for a score of these noisy parrots to be perched on the roof of a hut at one time. It has been before observed that some species of the *Trichoglossinæ* affect a meat diet occasionally; the Kaka is fond of picking up shreds of fat; whilst at some out-stations in the interior, carcases of sheep hanging in the meat-gallows are at times covered with busy groups of beautiful green parroquets, that move restlessly about within and without the carcases, rending away morsels of fat. Here we have representatives of two genera of our honey-eating parrots showing a keen relish for grosser food than the delicate sweets that may be gleaned from expanded flowers.

A son of the writer obtained some fine specimens by means of a very simple snare, the noose made of a very slender strip of flax leaf attached to the end of a ricker or rod. He described the bird as exhibiting great boldness and confidence, clambering about the roof of the hut, allowing a very close approach: when caught they remained quite still, without any of the noisy fluttering which usually accompanies the capture of birds, even when managed with adroitness; they preserved this quiet demeanour till the noose had been removed. One of these birds was placed on the floor under an inverted American bucket, the places for the handle not permitting the rim of the bucket to touch the ground; the Kea quickly took advantage of this, wedged its long beak into the space, and, using its head as a lever, moved the bucket sufficiently to effect an escape from its prison.

On the other side of the river, just opposite the homestead where this was written, one station is greatly favoured by these visitors. During the winter season they become a perfect nuisance.

On one occasion the hut was shut up, as the shepherd was elsewhere required for a day or two. On his return he was surprised to hear something moving within the hut, and on entering found it proceeded from a Kea, which had gained access by the chimney: this socially disposed bird had evidently endeavoured to dispel the *ennui* attendant on solitude by exercising its powerful mandibles most industriously—blankets, bedding, and clothes, were grievously rent and torn, pannikins and plates scattered about, everything that could be broken was apparently broken very carefully, even the window-frames had been attacked with great diligence; in fact, the bird gave a new reading to that moral line of warning, "For Satan finds some mischief still for idle hands to do."

One more instance of this bird's mischief, or rather perhaps love of fun; on a back-country sheep-run, a mule packed with a full load of stores and sundries for one of the out-stations was peacefully pursuing its way, when on a sudden a Kea perched on the neck of the animal; this unexpected arrival was too much for the gravity of the mule; startled from its accustomed demure and patient demeanour, it plunged and kicked till it had freed itself both from the Kea and its well-packed burthen, the contents of its load being scattered in all directions.

Notwithstanding the high character which individuals of the species have earned for occasional indulgence in mischief, several have been kept as pets—not in wooden cages, by-the-bye, for a Kea has been seen by his gratified captor to eat its way out of such a place of confinement almost as quickly as it had been coaxed to enter into it. Two which had been tamed by a neighbouring friend were permitted to wander at large; they regularly returned to the house for their meals, and then rambled away again, scrambling and clambouring amongst the trees and outbuildings; any kind of food appeared to suit their accommodating appetite, but a piece of raw meat was evidently the *bonne bouche*. On the level ground its mode of locomotion is very peculiar; it is not so much a walk as a kind of hopping jump, which imparts a very odd appearance to its gait, but when its strong climbing foot is observed, this is not to be wondered at, for it will be seen how inferior is the strength and power of the two inside toes in proportion to that of the outer ones; the short tarsi also being unfitted for walking.

In addition to the superior size of the bird and the colour of its plumage, the beak presents a marked contrast to that of the Kaka; it is smoother, less curved, and much slighter, with a length of two inches from the gape to the point; the upper mandible, at the widest part—that is in a line with the nostrils—measures five and a half lines in width, with a height of seven lines.

In flight, the two species greatly differ, as they do in voice and in their breeding habits. The tree-loving Kaka occasionally makes its nesting-place and rears its young amongst rocks in wooded gullies. The Kea breeds in the deep crevices and fissures which cleave and seam the sheer facings of almost perpendicular cliffs that in places bound as with massive ramparts the higher mountain spurs. Sometimes, yet rarely, the agile musterer, clambering amongst these rocky fastnesses, has found the entrance of " the run " used by the breeding pair; has peered with curious glance on the worn track till the trace of its course has been lost in the dimness of the obscure recesses beyond the climber's reach. In these retreats the home or nesting-place usually remains inviolate; its natural defences of intervening rocks defy the efforts of human hands, unless aided by the use of heavy iron implements that no mountaineer would be likely to employ. The eggs as yet remain to be described: young birds have been taken from a locality on the Minaret run; amongst other places, on the Mesopotamia station on the Upper Rangitata. A few years back a prospector returning to the pale of civilisation from the distant mountains he had explored, brought with him in his camp-kettle, or billy, a pair of nestlings; on his long and solitary march these had shared his fare, and reached Christchurch in good and healthy condition. The mountaineer has employed his staff to get out the young; the alpine stock being thrust close to the birds, the mischievous youngsters cling to it with beak and claws, and keeping a tight hold, are drawn out with the stock.

Although comparatively few people are acquainted with the bird, it is not on that account to be considered rare; the reason it is so little known is the remoteness of its habitat from the centres of population. It certainly appears to be very local in its distribution; a straggler now and then has been observed far from its usual haunts, for in one instance we have a note of its occurrence at the Hororata, in the Malvern Hills, close to the edge of the Canterbury Plains. Its beak can inflict a severe wound; a friend of ours incautiously handling a pet had his hand bitten through by its powerful mandibles.

The month of March appears to be the moulting season, for some specimens obtained in the end of that month were observed to be clean moulted, whilst other birds, got some weeks earlier, had the new plumage only partially developed, such specimens presenting but a ragged appearance.

At the shearing muster of 1868, at Mr. Campbell's station at Wanaka, at Te Anau, and Wakatipu, and possibly on some other runs, it was noticed that many sheep appeared to be suffering from an hitherto unknown disease; it took the form of a sore, or scar, on the back, immediately in front of the hips. In some cases the part affected had a hard dry scab, or merely a patch of wool stripped off; others showed a severe wound, in some instances so deep that the entrails protruded,—every victim had been injured in precisely the same spot, fairly above the kidneys. It did not fail to strike the keen-eyed shepherds that the animals so maltreated were in the best condition, amongst which were found hoggets, fat wethers, dry ewes, and double-fleeced sheep. Many discussions ensued in the "warris" as to the cause of these scars and deadly wounds which thinned out some of the best sheep of the mob, and left others in a more or less sorrowful plight. Many a pipe was smoked out whilst shrewd heads were meditating and speculating on what could have occasioned such an inexplicable and mysterious visitation. At last a musterer gave it as his opinion that the injury was inflicted on the sheep by a kind of parrot, rather a tame sort of bird that was to be met with on the tops of the ranges, and that the said bird was uncommonly like a Kaka. This suggestion was received with ridicule, and his sharp-witted audience overwhelmed the observant musterer with jokes and quaint expressions of unbelief. But the shepherds saw Keas visiting the meat-gallows, tweaking off mutton fat with their strong beaks; soon after one or more hands actually saw a parrot on a sheep, plucking and tearing wool and flesh on a precisely similar spot on the back, where so many had been found to be fatally wounded.

Now that the men were on a track, there was plenty of evidence soon forthcoming as to the mischievous and destructive propensities of these bold assailants; the examination of the animals mauled so injuriously, showed that in the majority of cases very little of the flesh had been devoured; it had been torn away apparently, not so much for food, but rather as an obstacle that prevented the bird's being able to reach the kidney fat. The flocks that suffered most from these marauders were almost invariably those which were depastured on the higher mountain ranges where the nature of the country was exceedingly rugged. In these regions their peculiar domain, about the snow-line, for they seldom quit the tops, the birds, although gregarious, do not move about in large flocks: if as many as fifty are seen together, it is of rare occurrence; they usually are scattered in small flights, as from a pair up to perhaps the number of a dozen individuals. It is no exaggeration to place the extent of their range as covering some millions of acres; it stretches northwards from the towering highlands that enclose the picturesque shores of Te Anau and Wakatipu, through the whole length of the Mackenzie Country, as far as the jagged peaks against whose sides rest the numerous glaciers from which spring the Rangitata, the Ashburton, and the Rakaia; its dominion appears to be yet extending, for, whilst this paper has been preparing for the press, I have heard of Keas having been obtained at Grassmere by the West Coast Road. Pressing northwards, it is found at

Lochinvar, at the head-waters of the Esk, and towards the sources of the Hurunui.

Sheep whilst being got out of snowdrifts are often mortally hurt by the attacks of Keas; especially are the birds prone to molest those carrying double fleeces, as though they knew how firm a foothold they could maintain with their grip. When one of these sheep, temporarily exhausted with its exertions in toiling through deep snow under the burthen of two years' growth of wool, breaks off from the mob and leaves the track, desperately floundering into deeper snow wreaths, a flock of parrots, ever watchful, as they hover round, soon perceive their opportunity for mischief: they alight close to the spot where the sheep, unconscious of approaching danger, stands gazing fixedly in a state of helpless stupidity; gradually hopping or moving towards the victim with some show of caution, one of the Keas at last settles on the rump of the sheep, which, terrified at the strange visitor that thus besets it, bounds away; the bird now rises only to alight again on the same place, clutching into the wool with its sharp claws it retains its hold more firmly and tenaciously. In vain the tortured animal in the direst agony seeks to rid itself of its cruel persecutor, that boldly keeps its vantage; after running and struggling some distance, its efforts to escape become feebler; it is at length so hard pressed that in a few minutes it yields passively to the tearing and searching beak of the Kea, that seems to probe into the very core of pain; the wretched sheep sinks down paralysed with the excruciating torture relentlessly inflicted by its persevering enemy.

The spoil obtained by the sheep-killer is the much-coveted kidney fat, which once plucked out and devoured, the remainder of the carcase possesses no further attraction; it is quickly abandoned, and the dealer of mischief hies him off in quest of a fresh victim. The majority of the sheep thus attacked die under the infliction, but many recover, though wofully disfigured; when flocks are got into yards, a certain proportion bear the scar that tells of the onslaught of the Kea; some of the wounds appear quite dried up, the bones bleached, and the sinews hard and dry. One would be almost inclined to think that the parrots were actuated more by a spirit of mischief than by the pressure of hunger, as usually so very little of the flesh is eaten, the bird restricting itself to the kidney fat, for which dainty only it exhibits an appetite.

To obtain this much prized delicacy, such a large hole is pierced that the loins are lacerated and torn, so that the bones are often exposed, and the sinews "look like fiddle-strings," as a shepherd expressed it. In the winter months these attacks are most frequent. Newly-shorn sheep are as a rule unmolested; this may arise from the shortness of the wool affording a less secure hold than a full fleece, or more probably because there is an ample supply of food easily obtainable during summer and early autumn; in fact, sheep are neither disfigured nor destroyed during warm weather. Various attempts have been made to lessen the numbers of the mountain parrots; advantage has been taken of their confidence and boldness to kill them with sticks and stones; many are snared off the meat-gallows. On some stations hands are sent out to shoot them; cries of a wounded one will cause many to assemble around it; sometimes a number are destroyed on these occasions, but it is found that they grow shy and wary where a gun is often employed, as they are soon 'cute enough to know when a man carries a gun.

On one station, the winter before last, two men were engaged for the destruction of Keas at a shilling per head; to make the best of the nocturnal habits of the birds, these men ranged the mountains at night,—a sufficiently hazardous undertaking,—lighting fires to attract their game; in the daytime they rested, and prepared the skins for sale. After six weeks spent in this laborious and dangerous occupation, they had accumulated something over one hundred specimens. Although the number seems small, the loss amongst the sheep that season was lighter than the average for several years before on that part of the run on which the men were engaged. In hunting Keas there is great uncertainty in meeting with flocks of them, sometimes three or even four days may elapse without one being seen. On the western side of the island they fly from the Mount Cook range to the bluffs by the sea-shore, passing over the intervening wide areas of forest at a great height.

Last winter numbers appeared on the ranges about the Upper Rangitata, where hundreds were shot during the winter months of June, July, and August; numbers were killed on Dog Range, Ashburton, by hands employed in packing; and if one might judge from the number of heads and quantity of feathers lying about the camp, the men were rather fond of Kea pie.

From many sources we gather that the annual loss from the Kea to the sheep farmer on some runs where the bird is most destructive varies from three to five per cent. of the flock; this, for obvious reasons, is very unlikely to be over-estimated, but we can give instances where exceptional losses have been very heavy indeed. On one station on the Matatapu the owner resolved to begin cross-breeding; with this view twenty Lincoln rams were purchased; within a month nineteen of the number were killed by parrots. On another run, during the month of April, 310 strong young wethers were got in off the back-country; as it was late in the season the owner resolved not to shear them, but to put them on a good low-lying spur; in September they were looked at, and they were found lying in dozens with holes in their backs, untouched in every other part; of the original number, 105 only remained alive. This gives an idea of the destruction that threatens double-fleeced sheep.

On one outlying portion of a lake-run the birds were so destructive that, although there were 30,000 acres of good grass land, the occupiers decided not to place stock upon it; the losses had been so great that it was found better to abandon the country. In the great snow-storm of the winter before last they were seen to eat the flesh of sheep; this is given as of rare occurrence, for, as said before, they seem to be inspired by mischief rather than urged by the pangs of hunger. It has been suggested that their numbers might be reduced by means of poisoned fat; those interested will doubtless be ready to make any experiment which holds out hope of saving their flocks from very considerable losses. At present the Kea shows a remarkable exception to the almost universal declension in numbers of most species of native birds.

The following descriptions are taken from two specimens obtained on the banks of the Havelock:—

Male.—Bill smooth, curved; upper mandible dark brown colour, lightest at the culmen, approaching to black near the base, the inside marked with slight longitudinal furrows; lower mandible yellowish on the sides, furrowed on the inside; cere, covering the base of the upper mandible at its widest part, measuring five lines; nostrils raised or swollen; upper part of the plumage dull green, with a silvery shade; shafts of feathers dark brown; feathers tipped, sometimes margined, with dark brown; forehead brownish green; feathers which rest against the gape produced into hair-like points; under parts dull silvery geeen, with brownish wash; nape silvery green, with almost a collar of dark brown; quill-feathers, the third and fourth are the longest in the wing, dark brown, the basal part of the first four feathers blue on the outer web; inner web dark brown, toothed with pale yellow; the rest of the primaries of a brighter blue on the outer web; secondaries bluish green on the outer web, inner web brown, toothed irregularly with pale yellow; under wing-coverts yellow and bright scarlet, slightly tipped with brown; tail, shaft of feathers produced beyond the web, dull green shot with blue, with a broad mark or band of dark brown near the end, tip pale brown, inner webs toothed with yellow, under side of tail-feathers washed with yellow; lower part of back and upper tail-coverts green, shaded with dark orange-red, margined with brown; vent and under tail-coverts yellowish green. Bill, following the curve from gape to point, two inches; wings from flexure, twelve inches nine lines; tail, seven inches seven lines; tarsus, one inch seven lines; largest toe with nail, two inches three lines; total length from point of bill to extremity of tail, twenty-one inches.

Female.—The plumage is rather duller than that of the male, the under nape of neck closely marked with dusky brown. Bill, two inches; wings from flexure, twelve inches four lines; tail, seven inches; tarsus, one inch five lines; largest toe and nail, two inches three lines; total length, twenty inches nine lines.

[A living example of this Parrot, which has rarely been brought to Europe, may now be seen in the Zoological Gardens, Regent's Park.—Ed.]

NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

By John T. Carrington, F.L.S., and Edward Lovett.

(Continued from p. 205.)

Genus Achæus, Leach.

This genus is at present represented in Britain by one species only. It somewhat resembles the genus *Stenorhynchus*, but the rostrum is stunted, the carapace more tuberculated and larger in proportion to the length of the legs; the eyes are placed on long peduncles, and are non-retractile; the abdomen is six-jointed in both sexes, a fact which Bell was only able to record by reference to Milne-Edwards.

Achæus Cranchii, Leach.

As before stated, this species is the only one of the genus known as British, and its occurrence is rare even in favoured localities. The carapace is roughly triangular, contracted behind the eyes and suddenly enlarging into a prominence, and again into a rounded elevation at its lower angles; the legs are very hairy, the last two pairs having curved claws, as in the genus *Stenorhynchus*. The antennæ are also hairy, and the carapace moderately so. The rostrum is stunted, and is formed, as Milne-Edwards remarks, of "two little triangular teeth." The males appear to have the tuberculated structure of the carapace more decided than have the females. This species may be distinguished from young specimens of the genus *Stenorhynchus* by a prominence on the eye-stalk, by the shorter legs, and by the stunted rostrum.

Bell records two instances only of the capture of this interesting species. One specimen is stated to have been placed in the British Museum, and the other in Dublin. We have, up to the time of writing these notes, obtained sixteen specimens, twelve of which were dredged near the Channel Islands, whilst four, all males, were found amongst an immense number of various species of Crustacea which strewed the Sussex coast after the disastrous storm of January 18th, 1881. Two specimens are recorded from Galway; and in the Ann. & Mag. of Nat. Hist., vol. xvii., 1866, Mr. Spence Bate writes that he finds this species not uncommonly off the coast of Devon, and that five specimens taken from six fathoms near the Knap buoy off the western end of Plymouth breakwater appear to be distinct varieties; his attention was drawn to them by their habit, which he says is not usual—namely, that of covering themselves with sea-weed. In the typical form the spines are straight, which give a hairy appearance. In this variety the spines are curved, and lie close to the surface, which makes it look smooth. Closely inspected, the spines are hooked. Mr. Bate failed, however, to find any other difference to indicate that it is more than a variety. In Mr. Carrington's collection are two female specimens of *A. Cranchii*, well covered, even the legs also, with little bits of weed. These were obtained in the month of December, and from the fact of their being without ova at that time we may conclude that this species is probably with ova at the same period as those of allied genera.

The localities known to us for this species are the Channel Islands, Plymouth, the Sussex coast, and South Devon; specimens are recorded from Galway, but we have little doubt, if carefully looked for, it will be found elsewhere. Prof. Milne-Edwards when he wrote his work, gave Falmouth Bay as the only known locality.

Genus INACHUS, Fabr.

We now come to a most interesting and characteristic little group, consisting of three species at present known to Britain, so similar in their general features as to form a distinct and decided genus, and yet so varied in their specific features as to enable the most casual observer to define and recognise each individual species at a glance. This genus, like the former two, is included in the popular designation of "Spiders," and the general form of the carapace supports the theory that it constitutes a link in the development to the triangular form of the genus *Stenorhynchus* from the rounded or oval form of less highly developed genera and species.

The general form of the carapace in this genus is that of a rounded triangle, spinous and developed into rounded prominences, which will be specifically described. The antennæ are very short and the rostrum is stunted and cleft. The legs are long, but, like the peculiarity already mentioned with regard to the carapace, they appear to be in process of changing from the shorter and more easily protected appendages of the genera *Pisa* and *Hyas* to the long and attenuated legs of the genus *Stenorhynchus;* they are also stout to the second joint, when they rapidly taper off to the terminal joint.

The second pair of legs are the longest in both sexes. The abdominal segments are six-jointed in both sexes. The eyes are situated on short peduncles and are retractile, being the first genus we arrive at with this further peculiarity.

Inachus dorsettensis, Penn.

Bell says that this species was first described by Pennant from specimens in the Portland cabinet, and captured at Weymouth, giving it the name *I. dorsettensis.* M. Milne-Edwards has described it under the name of *I. scorpio.*

In the carapace of this species the lower sides are developed into rounded bosses armed with a stout spine, and between them there is a smaller prominence with another spine. The anterior portion is armed with four small tubercles placed in a row. This is a characteristic mark of the species. The abdominal segments have a ridge dividing them centrally. Those of the female are very broad, affording great protection to the ova; those of the male widening at the third and fourth joints, and slightly at the last. The rostrum is stunted and notched centrally, widening more than that of the two following species; this is another specific distinction. The eyes are retractile, or rather can be turned back into their orbit-cavities, and are protected by spines on the anterior and posterior margins of the orbits. The antennæ are very short, the movable portion extremely so. The legs are elongated, and the anterior pair in the male developed into stout pincers or forceps, which are but small and insignificant in the female.

This species is pretty generally distributed, and appears to affect both deep and moderately shallow water. M. Milne-Edwards, under the name of *scorpio*, speaks of it as inhabiting the shores of the "channel" and the "ocean." We have obtained it in considerable numbers from various parts of the English Channel, principally off the Sussex and Dorset coasts; some females that we obtained from Weymouth in December were with immature ova. It has also been recorded from St. Andrews (occasionally), Shetland (very rare), Galway (common), Belfast, Dublin Bay (thrown up after storms), Hebrides, Plymouth, and Hastings, while Fabricius found it in the Norwegian seas. Couch states that it is taken commonly in crab-pots, Cornwall; and Professor Wyville Thompson ('Depths of the Sea,' p. 181) speaks of *Inachus dorsettensis* as occurring in deep water, as also did Capt. Beechey, R.N., who is stated to have brought up a specimen alive from a depth of 140 fathoms in the Mull of Galloway. It thus appears to be a fairly well-distributed species, and, from our own experience, we should advise collectors to examine catches of *Stenorhynchus*, as this species sometimes occurs with them.

The ova of this species are very similar to, though somewhat larger than, that of the genus *Stenorhynchus;* they are of an orange colour deepening to a rich red as development of the yelk proceeds.

We have not yet had an opportunity of seeing the zoeæ form, but imagine it to resemble that of the genus *Stenorhynchus*. Our excuse for referring so frequently to genera already described is, that we find points of definition and determination are much better understood by drawing comparisons to what is already recognised and familiar; besides the interest which attaches to the development of forms from one type to another under new or varied conditions of existence.

Inachus dorhynchus, Leach.

This species so much resembles the last that it will be more easily understood if we simply describe the specific distinctions. The carapace is less developed into rounded bosses, and the row of four small tubercles which characterises *I. dorsettensis* is represented in this species on the anterior portion of the carapace by two spines, one situated beneath each spine of the orbit.

The rostrum is nothing more than the anterior angle of the carapace cleft to a slight depth, varying in some cases to a mere notch. The hands are smoother than those of the former species, and the first two joints of the other legs less robust.

Bell seems to think that its resemblance to the former species may cause it to be mistaken for that, and thus account for its apparent rarer occurrence. We are, however, inclined to think that it is undoubtedly far less common than *I. dorsettensis*. We have also observed a most decided difference in general appearance; *I. dorhynchus* being smaller, less robust, and of a pinker colour than the species previously described. This species is also generally cleaner and brighter, and less affected by artificial covering of sponges, &c. The female was unknown to M. Milne-Edwards.

Inachus dorhynchus has been recorded as taken at Shetland, Belfast, Dublin Bay (common), Galway, St. Andrews (occasionally), Cornwall, Hastings, Durham, and Berwick. We have obtained it from Jersey, from crab-pots, in November, when some of the females were with mature ova, which resembles that of *I. dorsettensis*, but we have had little opportunity for examining it as yet.

Inachus leptochirus, Leach.

This most interesting species differs from the two preceding in one or two important details. The carapace is extremely like that of *I. dorhynchus*, although Bell figures it as proportionately smaller and more simple, which we have not found to be the case in the large number of specimens which we have examined. The legs are very long, much longer than those of either of the other two species of the genus; the anterior pair are particularly striking in this respect, and mark the distinctiveness of the species at a glance. Its most remarkable and characteristic feature is the existence, in the male, of a polished calcareous tubercle on the sternum, between the bases of the leg joints: this tubercle is peculiar to the genus, and is only represented in one other known species from the Mediterranean, viz., *I. thoracicus*, in which it forms a plate. "Sternum du mâle, garni en avant de deux plaques calcaires ovalaires réunies par une pièce médiane."*

Bell speaks of this species as being "extremely rare," and gives solitary instances of its capture, stating that it was discovered by the late Mr. Cranch on the west coast of Devon and Cornwall: it has since been recorded from Shetland (deep water), Dublin, Belfast, Clifden, and the Hebrides, and there is no doubt that it is less common than *Inachus dorsettensis*, and may be looked upon with *I. dorhynchus* as "a good thing." We have fortunately obtained a fine series of this interesting crustacean, many of which were taken from the deep part of the English Channel, off the Sussex and Dorset coasts. Another locality from which we obtained it was off Guernsey in a crab-pot; and this leads to a remarkable instance of extreme locality, which may possibly account for the supposed great rarity of this species. A fisherman who worked regularly a number of crab-pots stated that this crab always occurred in quantities in one particular pot, and never by any chance in any others in the locality, not even in the next pots on either side. Upon repeated visits we found this to be literally true, and this one little spot is the only place there upon which we can rely to obtain this species. Another of this same set of pots was also similarly resorted to by a starfish, *Ophiocoma granulata*, this instance helping out the other in proving that this extreme limit to localities does most certainly exist as much on the sea bottoms from some favourable cause or other, probably the presence of congenial food, as it does on land where the presence of certain conditions favours the existence of individual species, and confines them to limited areas.

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* Milne-Edwards, 'Hist. Nat. des Crust.,' vol. i., p. 289.

Inachus leptochirus is with ova in November, those we observed at that time being in an immature condition. The ova resemble those of the two preceding species, being spherical and of a rich orange colour, becoming darker as the zoeæ forms; the zoeæ itself we have not yet seen. The swimmerets of the females of this genus are admirably adapted to protect the ova, and are, moreover, beautiful objects when examined by the microscope; they resemble very much the plumose antennæ of the males of many of the *Nocturni* amongst the Lepidoptera; their position and duty in the economy of the animal is a most interesting one, and perhaps no other genus of British Crustacea than *Inachus* shows this remarkable development to such advantage.

(To be continued.)

OCCASIONAL NOTES.

WILD CAT BREEDING IN CONFINEMENT.—In the review of Prof. Mivart's work on 'The Cat' (p. 269), I am said to have "succeeded in getting the wild and domestic cat to breed together in confinement"; but this I cannot claim to have done, as I never even attempted to cross-breed from any of my Wild Cats. It was Mr. Pusey, of Pusey House, Berks (erroneously mentioned as in Oxfordshire in my letter in 'The Zoologist' for 1873, p. 3575), who bred several hybrids between the two animals, a handsome pair of which he presented to the Zoological Society, as I mentioned (*loc. cit.*). I can, however, claim to have "ascertained the curious fact (p. 270) that the period of gestation in the Wild Cat is sixty-eight days, or twelve days longer than the ordinary gestation of a tame cat"—a pair of Wild Cats in my possession having bred four consecutive years (1875—1878), the first two occasions being recorded in 'The Zoologist' for 1876. The litters consisted of three and two alternately.—ALFRED HENEAGE COCKS (Great Marlow, Bucks).

SUPPOSED OCCURRENCE OF THE CRANE IN CO. DUBLIN: CORRECTION OF ERROR.—There is a strange alteration in my notice of the Crane at Howth (p. 259) which appears to have arisen from your having expanded my meaning beyond my intention. By "appendage to the tail" I intended to refer to the bushy, loose tail-coverts which collect over the rump in a large tuft or bunch, and are in themselves sufficient to enable one to identify the bird. The *legs* were not noticed by my friend, and your having laid stress on them and not on the tail-feathers seems to me to have weakened the identification. There is also an unfortunate repetition at the end of the notice, by which the two specimens in the Dublin Museum are multiplied into four. Will you kindly insert this necessary correction?—Henry Chichester Hart (71, St. Stephen's Green, Dublin).

[We regret that, in endeavouring to elucidate our correspondent's meaning, we have placed a wrong construction on his words. We took it for granted that by "appendage to the tail" he could only mean an *apparent* appendage caused by the bird carrying its legs straight out beyond the tail after the fashion of Cranes, Herons, Storks, and other long-legged birds. The well-known "plumes" to which he now says he intended to refer are in no sense of the word "an appendage to the tail"; nor are they, as he supposes, "tail-coverts." They are simply the elongated tertials with unconnected webs, reaching beyond the extremities of the primaries. We trust under the circumstances our correspondent will pardon the unintentional perversion of his meaning. With regard to the "repetition" at the end of the notice to which our correspondent refers, we can only say that we printed his own words.—Ed.]

Supposed Occurrence of the Virginian Horned Owl in Ireland.—Having recently examined five specimens of the Virginian Horned Owl in different museums, I am convinced that Dr. Burkitt's bird (described by me, p. 262) is of that species, and is not an Eagle Owl. Besides its smaller size and general dissimilarity of appearance, it has not the long distinct black spots characteristic of the Eagle Owl, while its more intricate markings and the rounded spots of white on many of its feathers may be seen on specimens of the *Bubo Virginianus*, a species which, however, seems to vary much in its markings. If I have correctly determined this specimen, it is, I believe, the only instance on record of the occurrence of the Virginian Horned Owl in the British Islands, if not in Europe; and Dr. Burkitt (who obtained the only specimen of the Gold-vented Thrush and of the Hawk Owl in these islands, as well as a Great Auk) will have preserved to us more than one unique specimen of a straggler to our shores. With the Great Belted Kingfisher and the Yellow-billed American Cuckoo it has reached this Ultima Thule from beyond the Atlantic. Dr. Burkitt's notice of it, made at the time, states that it was shot at Belle Lake (Co. Waterford) on January 27th, 1851.—Richard J. Ussher (Cappagh, Cappoquin).

Lesser Snow Goose in Ireland.—In 'The Zoologist' for 1878 (pp. 419, 453) I gave some account of the capture in the Co. Mayo of the Lesser Snow Goose, *Anser albatus*, Cassin. It may be recollected that out of a flock of seven which visited some marshy ground at Termoncarra, in the Barony of Erris, in October, 1877, one was shot, and another subsequently trapped. The latter, a gander, was after a temporary confinement placed with some domesticated geese. I have just been informed that it is still alive, and after slaying a rival in fair fight, has paired with one of the common geese, and assisted to rear a little family of goslings. As this is, I believe, the first time that so remarkable a cross has occurred, it seems well worthy of being placed on record. As the goslings are still too young to judge of what their adult appearance may be, a description must, for the present, be reserved.—J. E. HARTING.

RARE BIRDS IN SOMERSETSHIRE.—Mr. H. Mathias, of Haverfordwest, has a small collection of Somersetshire birds which he purchased some few years ago at the sale of Mr. Spalding, of Chilton Poldon, near Bridgewater, who was a collector of local antiquities and rare birds. Among these last were a Black-winged Stilt, a Bee-eater, and a Little Crake, all obtained near Bridgewater, and also a Pratincole, shot on the Mendips, "near Weston-super-Mare." As the number of British-killed Pratincoles is very small, it is worth while to record this one, of which no information, so far as I know, exists in any local catalogue.—MURRAY A. MATHEW (Stonehall, Wolf's Castle, R.S.O., Pembrokeshire.)

SUBCUTANEOUS WORMS IN PEREGRINE FALCON.—At page 515 of 'The Zoologist' for 1880, Mr. A. Bevington reports that, in a Peregrine which he examined, he found several white worms under the skin at the back of the abdomen. I had an opportunity last winter of dissecting a female bird of this species in dark plumage, which appeared to me to be a very old bird, the muscles being exceedingly tough; and in this specimen I found numerous long thread-like bodies closely imbedded between the peritoneum and subserous tissue both at the back of the liver and stomach. So firmly were they invested that I had regularly to dissect them out, and I fear have broken them in places. I send them for your inspection, together with a piece of tissue still containing one or part of one.—HERBERT LANGTON (Brighton and Hove Dispensary, Brighton).

[We forwarded the phial and its contents to Dr. Spencer Cobbold, whose special knowledge on the subject of Entozoa renders his opinion in a case of this kind most valuable, and he has been good enough to send us the following interesting report.—ED.]

"The parasites submitted to my examination are examples of *Filaria attenuata*. In the month of April, 1855, I removed a worm of this species from the back of the abdomen of a Peregrine. This worm measured as much as ten and a half inches in length (Linn. Trans., vol. xxii., p. 164). *Filiariæ* are remarkably abundant in the muscles and soft parts, not only of the rapacious, but also of the passerine and some other birds. Probably not a few of the various alleged species are identical. Be that as it may, the worms found by Messrs. Langton, Bevington, and myself, are evidently referable to the commonest known form. Falcons, Hawks, and Owls are equally liable to harbour *Filaria attenuata*, which likewise infests the Crows, Nutcrackers, Starlings, and many other passerine species. To be more precise, this Entozoon has been obtained from six different species of *Corvus*, and it has likewise been found in the genera *Garrulus*, *Pica*, *Pyrrhocorax*, *Nucifraga*, *Sturnus*, and *Cassicus*. To determine the source of this and other *Filariæ* infesting birds remains a problem for future investigations to solve. We possess, however, some general knowlodge of the habits of these worms, and from the recent observations of Sonsino, Manson, and Lewis respecting the Micro-Filariæ of *Corvus splendens* there can be little doubt that all the *Filariæ* are migratory in habits, requiring a change of hosts. In *Pica caudata* the embryos of this species were found in the blood. The subject is very complicated; but in this connection permit me to call especial attention to the remarkable finds of Dr. Manson in China. Hæmatozoa, and sometimes the parent *Filariæ*, were found by Manson in *Pica media*, *Gracupica nigricollis*, *Corvus torquatus*, and *Goura coronata*. A curious pathological appearance is presented by the heart of the Chinese Magpie stuffed with specimens of *Filaria picæ-mediæ* (Mans. & Cobb.), but it is not more remarkable than the similar appearances that are to be found in many other vertebrates. Further particulars on this subject will be found in the 'Journal of the Quekett Microscopical Club' for August, 1880."—T. Spencer Cobbold.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Linnean Society of London.

May 5, 1881.—Arthur Grote, Vice-President, in the chair.

Prof. Eichler, Director of the Botanic Gardens, Berlin, and author of several important botanical contributions, was elected a Foreign Member.

Mr. C. Stewart exhibited and described an ovum of *Helix hæmastoma*, remarkable for its great size as compared with that of the animal. The generative organs are also peculiar.

Mr. George Busk gave an abstract of a "Descriptive Catalogue of the Species of *Cellepora* collected on the 'Challenger' Expedition," in which some thirty-one species of this Polyzoan genus are referred to. Of these the North-Atlantic yields three from depths ranging from 51 to 450 fathoms. The South Atlantic furnishes five species from 500 to 600 fathoms. Of seven species from the immediate neighbourhood of Kerguelen Land (or so-called South Indian Region) three were got from depths ranging from 20 to 150 fathoms. From the Australian Region eleven species, with one exception (*C. solida*), obtained from two to four fathoms. Only two species obtain from the North Pacific Region, respectively 18 to 310 fathoms. From the South Pacific 304 species have been derived, 45 to 150 fathoms being the extremes of depths, save in the case of *C. magellensis* from 1325 fathoms. Mr. Busk arranges the 'Challenger' *Celleporæ* into five sections distinguished by the general habit of the Zoarium, *viz.*:—(1) Encrusting or foliaceous expanded; (2) Hollow or more or less cylindrical; (3) Branched, solid; (4) Of massive irregular growth; (5) Fusiform. He describes among others some thirty new species, and observes that as a whole the genus *Cellepora* of this Expedition appear to belong to comparatively shallow water.

Anniversary Meeting, May 24, 1881.—Prof. ALLMAN, LL.D., F.R.S., President, in the chair.

There was a numerous attendance of the Fellows. The Treasurer (Mr. F. Currey) read his annual report stating that financially the Society continued prosperous. Afterwards the Secretary (Mr. B. Daydon Jackson) read his report. Since the last anniversary eleven Fellows of the Society had died and four had withdrawn; against this thirty-seven new Fellows had been elected, besides one Foreign Member and one Associate. After fifty years' service Mr. Kippist had resigned his position as Librarian to the Society, and the Council, in acknowledgment thereof, had granted him a retiring pension. Prof. Allman then delivered his anniversary address, his subject being "Recent Advances in our Knowledge of the Development of the *Ctenophora*." The Secretary afterwards read obituary notices of the several Fellows, making special mention of Mr. E. R. Alston, Mr. John Gould, Mr. Gerrard Krefft, Dr. Lauder Lindsay, and Mr. A. Pryor.

The Scrutineers reported that Mr. A. W. Bennett, Mr. F. Darwin, Prof. E. R. Lankester, Sir J. Lubbock, and Mr. J. G. Romanes had been elected into the Council, in the room of E. R. Alston (deceased), Dr. T. Boycott, Prof. M. Foster, Dr. J. G. Jeffreys, and Prof. Mivart, who retired; and for officers, Sir J. Lubbock as President, F. Currey as Treasurer, and B. D. Jackson and G. J. Romanes as Secretaries.

June 2, 1881.—Sir J. LUBBOCK, Bart., F.R.S., President, in the chair.

Mr. R. Romanes, of Rangoon, was elected a Fellow.

Dr. G. Hoggan exhibited and made remarks on preparations of the lymphatics of vascular walls.

Mr. Elwes exhibited samples of quinine made by a new process, without expensive chemical apparatus, by Mr. Gammie, superintendent Government Cinchona plantations of Sikim.

Sir J. Lubbock read a paper "On the Habits of Ants."

Mr. S. O. Ridley read a paper "On the Genus *Plocamia* of Schmidt, and some other Echinonematous Sponges." With reference to the genus mentioned, for which he accepted Prof. Duncan's name of *Dirrhopalum*, he enumerated three species already described, but assigned to other genera, which must be added to it; the distribution is thus extended from the tropical Atlantic to the British, Portuguese, and Ceylon seas. He described a New Zealand species which proves to be new to science, and appears to decide a point which has been disputed—*viz.*, the existence of ceratinous material in the skeleton. Geological facts were brought forward showing the existence of the genus in the Eocene upper chalk and greensand formations. A new genus of the same order was described, based on a species of Lamarck, and two other species; it is closely allied to *Dictyocylindrus;* its distribution extends from Arabia to Australia.

Prof. P. M. Duncan made a communication on two new species of Sponge from the Atlantic sea-bed.

The ninth part of "The Mollusca of the 'Challenger'—Family of *Pleurotomidæ*," by the Rev. R. Boog Watson, was read in abstract by the Secretary.

June 16, 1881.—Sir J. Lubbock, Bart., F.R.S., President, in the chair.

Mr. Alexander Somerville, Capt. J. T. Wright, and Mr. John Forrest, the Australian explorer, were elected Fellows of the Society.

The Rev. W. Higgins exhibited a specimen of *Holothuria* which had been obtained between Patagonia and the Falkland Islands. This he had identified as *Psolus squamatus*, and he observed that it had been figured by Otho F. Müller, in his 'Zoologia Danica,' but its southern locality now adds an interesting proof of the wide distribution of the species.

A paper was read entitled "A Revision of the *Idoteidæ*," a family of Sessile-eyed Crustaceans, by Mr. E. J. Miers. In this contribution the author, after some introductory remarks on the history and classification of the group, enumerates critically forty-seven species, besides several varieties, distributed into four genera. The *Idoteidæ* are found in all parts of the globe, but more abundantly in the temperate and colder seas than in the tropics, and usually at moderate depths on sandy, muddy, or rocky bottoms. Their nearest affinities are with the *Chætiliidæ* and *Arcturidæ*, and whether the latter finally may be associated with the *Idoteidæ* future workers will determine.

A communication was read "On the Nostrils of the Cormorant," by Professor Ewart. Certain structural peculiarities were described which apparently accounted for, or seemed possibly connected with, the bird's habit of flying with its mouth open.

The President then announced the close of the Session, and that the next evening meeting would be held on November 3rd, 1881.—J. Murie.